conspicuous objects on nights when the seeing is good, and the times of their passages across the planet's central meridian are easily secured. The following are the longitudes of a few of these formations as computed from System II. of the ephemerides:—

			Long.
		°	°
1.	Dark elongated spot in	Lat. + 15 ...	120
2.	,, ,,	Lat. − 35 ...	150
3.	,, ,,	Lat. + 15 ...	254
4.	,, ,,	Lat. + 33 ...	268
5.	,, ,,	Lat. + 39 ...	282
6.	,, ,,	Lat. + 15 ...	298

Nos. 1, 3 and 6 are placed in the bright tropical zone, and immediately outlying the northern edge of the north equatorial belt. They are moving somewhat faster than the red spot, as their longitude appears to be decreasing at the rate of about 10° per month. Nos. 4 and 5 in the north temperate zone are moving at approximately the same velocity as the red spot.

There are some well-defined irregularities in the north side of the northern equatorial belt, which exhibits both white and dark spots. Their motion is evidently controlled by a rapid current similarly to that of the white and dark equatorial spots, but not, perhaps, quite so extreme.

Bright spots appear in the zone south of the red spot, and several of these are being attentively followed with the object of determining their periods.

On the whole the planet's appearance is now singularly replete with detail, and will compare favourably with that exhibited at any previous opposition. The great red spot has, it is true, long since lost the intense brick-red colour it displayed in the years 1878–81; nor have we now the exceedingly brilliant white equatorial spots of the period named. But appearances are now visible on the disc which were absent then, and among the most interesting of these are the elongated dark spots situated just outside the margin of the north equatorial belt.

Though past observation has fully demonstrated the proper motions of the different markings and the decreasing velocity of several of them, it is highly important that the rate of the various currents should be redetermined every year. The character and number of the spots found in them should also be recorded, and measures made to determine the latitudes of the belts. Pursued through a long series of years, such data might ultimately give us the proof of periodical variations in the character and number of the spots, and possibly also in their rates of motion. W. F. Denning.

THE LONDON UNIVERSITY BILL.

THE friends of education and many friends of the Government are disappointed at the postponement of the second reading of this Bill in the House of Commons. The cynics are saying that aristocratic Government and University representation are either jointly or severally responsible for this recurrent paralysis in the treatment of a question of the greatest importance to the greatest city of the world.

NATURE is not a political organ, and these points need not therefore occupy us; we can only express regret that the way in which all matters connected with science and education are handled in this country is so vastly different from that meted out to them in France or Germany. The *Times* writes as follows:

> It is no longer denied in any quarter that the absence of a teaching University in the capital of the British Empire and the greatest city in the world is an anomaly and almost a scandal. The alternative which commends itself to Mr. Moulton and the anti-reform party is that a new teaching University should be set up alongside of the present examining University, but this scheme has been rejected by the vast majority of intelligent men who have taken even the slightest pains to look into the subject. What the Government desire—in accordance, we believe, with the immense preponderance of authority on this question—is to connect a teaching University, under which degrees will be given as the hall-mark of a systematic intellectual training, with the existing system of examination pure and simple. The latter, it is pointed out, is left entirely untouched, though there is a strong and growing conviction that it never can be, even in part, a true development of the highest education, but must tend, more and more, to pass under the dominion of the crammer. But the preservation of the existing method of giving degrees makes it imperative, if the teaching work of the University is to be a reality and not a sham, that there should be a double system of examinations, the one for "internal" and the other for "external" students. The Bill provides, necessarily and inevitably, for this distinction, but the most careful securities are adopted that no unfair advantage shall be given to the former class, and, especially, that the examination of students by the teachers who have trained them shall be supplemented and checked by the admission of an independent element. It would seem to be forgotten that the medical degrees of the London University, which undoubtedly stand highest in public estimation and of which the standard is rigorously high, are granted on the reports of examiners many of whom are teachers in the medical schools. The cry for identity of examinational tests is irrelevant and inconsistent. It is, as Dr. Allchin urges, "an attempt to subordinate the examinations to the requirements of those who have neither been trained nor educated in the fullest sense of the word." This is the very essence of the bondage from which for many years past the higher education in London has been struggling, under the guidance of such men as Huxley, to escape, and from which deliverance is now in sight, if Ministers will only have the courage of their opinions and be true to their pledges.

Whether the paralysis comes from want of knowledge or want of courage, it is very clear that there is at the present a great gap in our administrative machinery, and one which a Scientific and Educational Committee of the Privy Council might easily fill if the right men were appointed to it.

NOTES.

THE death is announced of Prof. Aimé Girard, member of the Section of Rural Economy of the Paris Academy of Sciences. Referring to the deceased investigator at the meeting of the Academy on April 12, M. Th. Schlœsing remarked: M. Aimé Girard was the highest authority on chemical and agricultural industries in the Academy. After some valuable scientific work he was nominated professor of industrial chemistry at the Conservatoire des Arts et Métiers, in succession to Payen. His teaching revealed the dominating object of his efforts. Affable and cheerful, loyal and entirely disinterested, he possessed all the attributes required to gain the confidence of manufacturers. The producers whose places he visited, in France and in other countries, became and remained his friends; they gave to him a large amount of information which he used to enrich his attractive lectures, and in return M. Girard offered them advice suggested by his experience and his own investigations. In a few years his masterly researches on vegetable fibres, wheat, farinas, sugars and woods had made him the first authority upon these matters, and he was frequently consulted by the Government on subjects concerning the great industries of paper, alcohol, sugar, flour, and bakery. The study of these products led to inquiries as to crops. In this new direction M. Girard rendered valuable services, and, after his researches on the cultivation of sugar-beet and the improvement of the potato, he obtained among agriculturists the same position and the same sympathies which he enjoyed in the industrial world. Though weakened in recent years by illness, and saddened by repeated troubles, he nevertheless continued his work. He died while occupied in applying to wheat of various origins the new methods of analysis which were the subject of a recent communication to the Academy. The vacancy which his death has caused enables us to estimate the high place which he occupied in scientific societies and in the committees in which he took part.

We learn from the *Electrician* that a banquet to M. Z. Gramme, to celebrate his receiving the decoration of Commander of the Ordre Léopold, was lately held at the Hôtel Métropole, Brussels. The Senator, M. Montefiore-Lévi, presided, and among the guests, who numbered 130, were Prince Roland Bonaparte, the Minister M. Nyssens, representing the Belgian Government, the Burgomaster and Aldermen of Brussels, M. Mascart (president of the Organisation Committee), M. A. d'Arsonval (president of the Société Internationale des Electriciens), and M. Hippolyte Fontaine, manager of the Gramme Company. M. Mascart, in an eloquent speech, traced the career of M. Gramme, from his commencement as a simple workman in the tiny Belgian village of Jehay-Bodégnée down to the present day, and presented the great Belgian electrician, in the name of the electricians of the whole world, with a fine gold medal engraved by Chaplain. After the banquet the guests were received by the Town Council in the Hôtel de Ville. Profs. Ayrton and Silvanus Thompson, who had been appointed delegates by the Institution of Electrical Engineers, were unable to reach Brussels on account of a storm, and the illuminated address of congratulation, of which they were to have been the bearers, had to be sent by post. Numerous congratulatory telegrams were received, including one from Lord Kelvin and one from Mr. W. H. Preece.

The ninth international Congress of hygiene and demography was opened at Madrid on April 10. About two thousand members attended the Congress, but less than fifty English delegates were present. The opening ceremony took place in the National Library, under the presidency of the Minister of the Interior, who was supported on the right by the Governor of Madrid, the acting President of the Congress, Dr. Julian Calleja, and by the Secretary-General of the Congress, Dr. Amalio Gimeno; on the left by Prof. Brouardel (Dean of the Paris Faculty of Medicine) and the Mayor of Madrid. Dr. Calleja delivered the inaugural address, and in a few words of greeting extended a warm welcome to the members of the Congress, wisely reminding the audience that the science of public health was confined to no nation in particular and to no one science specially. Dr. Brouardel spoke on behalf of the Permanent International Committee, and he was followed by delegates from the nations represented at the Congress, after which the Minister of the Interior pronounced the Congress open. In the evening a gala performance was given in honour of the members of the Congress at the Spanish Theatre. A reception was held at the Athenæum Literary Club on the evening of Monday, April 11, and on Friday, April 15, there was a reception of the members of the Congress at the house of the Prime Minister, while on Saturday certain delegates had the honour of presentation at Court. The scientific work of the Congress was carried on in the various sections during the whole of last week, and a large number of papers of importance to the science of public health were read.

The fifth centenary of Paulo Toscanelli and Amerigo Vespucci is being held with much gaiety at Florence. The festivities will continue until the end of this month, and the programme comprises a geographical congress and the inauguration of several monuments.

About 10·15 p.m. on Tuesday, April 5, a meteor of exceptional size and brilliancy was observed at Ealing slowly traversing the sky in an easterly direction. After a few seconds the meteor burst, and then shot forward with increasing velocity, and disappeared after being visible about ten seconds.

A lecture upon "The Progress of Optics during the Present Century" will be delivered at the Mansion House this evening, by Dr. G. Lindsay Johnson, under the auspices of the Worshipful Company of Spectacle Makers. The Lord Mayor, and subsequently the Astronomer Royal, will preside at the lecture.

The ninth annual meeting of the Museums Association will be held at Sheffield in the first week of July. The Lord Mayor and Corporation of Sheffield offer a cordial welcome to all members of the Association, and are very desirous of making the meeting in every respect successful. All the business will be carried on in the Town Hall, the use of which has been granted to the Association. The President-elect is Alderman W. H. Brittain, and the Secretary is Mr. E. Howarth, Public Museum, Sheffield, to which address communications from members who propose to read papers should be sent.

At the annual meeting of the Iron and Steel Institute, to be held on Thursday and Friday, May 5 and 6, under the presidency of Mr. Edward P. Martin, the Bessemer gold medal for 1898 will be presented to Mr. Richard Price-Williams in recognition of the active part he took in the early days of the use of steel on railways. Among the subjects of papers that are expected to be read and discussed are: The iron industry of the Urals, by Prof. H. Bauerman; the solution theory of iron, by the Baron Hanns Jüptner von Jonstorff; brittleness in soft steel, by Mr. C. H. Ridsdale; allotropic iron and carbon, by Mr. E. H. Saniter; the crystalline structure of iron, by Mr. J. E. Stead.

The third annual Congress of the South-eastern Union of Scientific Societies will be held in the Town Hall, Croydon, on June 2-4. On Thursday evening, June 2, the President-elect, Prof. G. S. Boulger, will deliver the annual address. Among the papers to be read on the following day are—entomology as a scientific pursuit, by Mr. J. W. Tutt; the place of geology in education, by Prof. Logan Lobley; the nature of the soil in connection with the distributions of plants and animals, by Dr. H. Franklin Parsons; natural gas in Sussex, by Mr. C. Dawson. On Saturday, June 4, a discussion will take place on ideals for natural history societies, and how to attain them; and Mr. E. M. Holmes will read a paper on botanical work still wanting workers. A museum arranged by the local committee, illustrating the natural history of the neighbourhood and other subjects, will be open during the Congress.

The *Times* correspondent at Athens writes, under date April 18:—The French School of Archæology was to-day the scene of a brilliant assembly. The King, who was accompanied by the Crown Prince and Princes George and Nicholas, arrived at eleven o'clock, and tendered his congratulations to M. Homolle, director of the School, on the occasion of its jubilee. M. Zaimis (the Prime Minister), M. Romas (President of the Chamber), M. Delyanni, M. Ralli, and all the principal members of Athenian society were present, together with a great concourse of foreign visitors. In the course of an interesting address, M. Homolle made the announcement that M. Syngros, the Greek millionaire, had decided to erect a museum at Delphi. Speeches were then delivered by M. Cavadias, in the name of the Greek Archæological Society, by Dr. Dörpfeld, on behalf of the foreign schools in Athens, and by M. Collignon, as representing various French scientific institutions. Count d'Ormesson, the French Minister in Athens, also delivered an address.

By establishing a National Zoological Park, having for its chief object the collection and preservation of American animals likely to become extinct, the Smithsonian Institution has been the means of developing an intelligent interest in such collections in the United States, and has stimulated other enterprises of a similar character. Among similar zoological preserves, which have been projected and established in the United States since the establishment of the National Zoological Park, are the following:—The Blue Mountain Forest Park, established by the late Mr. Austin Corbin, is a large tract of forest and abandoned farm land, situated in the western part of New Hampshire, comprising an enclosed area of 26,000 acres. Within this enclosure are kept about 4000 wild animals, including 74 bison, 200 moose, 1500 elk, 1700 deer of different species, and 150 wild boars. These animals are rapidly multiplying, and, with the exception of the bison, which are sheltered and fed during the winter, live in perfect freedom. In the Adirondack region of New York a game preserve of 9000 acres has been stocked with elk, Virginia deer, mule deer, rabbits, pheasants, &c., and Mr. W. C. Whitney has established a preserve of 1000 acres in the Berkshire hills, near Lenox, Mass., where he maintains not only the species of animals above mentioned, but also bison and antelope. Other preserves are Ne-ha-sa-ne Park, in the Adirondacks, 8000 acres; Tranquillity Park, near Allamuchy, N.J., 4000 acres; the Alling preserve, near Tacoma, Wash., 5000 acres; North Lodge, near St. Paul, Minn., 400 acres, and Furlough Lodge, in the Catskills, New York, 600 acres. These are all fenced enclosures, well stocked with animals. At Pittsburg, Pennsylvania, in one of the public parks, a number of buildings intended for the exhibition of animals are being constructed. These are already nearing completion, and will cost more than 200,000 dollars, exclusive of the animals they are to contain. A further collection of buildings and enclosures intended for American animals only is also projected for that city. Finally, the New York Zoological Society has obtained from the city of New York a grant of some 261 acres in the southern portion of Bronx Park, near that city, for the purpose of establishing there a zoological garden, which is to be free to the public for at least five days in each week. Plans are now being prepared for the development of a collection on the most generous and attractive scale. The bulletin issued by the Society states that it is expected that there will be at once spent 125,000 dollars for preparing the ground, and 250,000 dollars for buildings and enclosures.

THE colony of beavers in the National Zoological Park, Washington, have now made themselves completely at home. The animals have constructed three large dams, one of which is at least 4 feet high. Each of these has been built wholly by the beavers themselves, either from trees felled by them within the enclosure or from branches furnished them for food. They cut this material into suitable lengths, which they drag to the water, float to the dam, and there combine with mud and twigs to form a compact structure. In connection with each dam they have built houses, together with several smaller burrows in the bank. The entrance to the houses is always under water, and can only be reached by diving. The animals have become quite accustomed to the presence of man, and it is believed that under proper restrictions the public may be allowed to see them at work.

DR. A. SLABY, professor of electro-mechanics and heat-mechanics in the Technical High School at Charlottenburg, contributes to the *Century Magazine* (April) an illustrated article upon telegraphy by electric waves—*stromtelegraphie* or "telegraphy by circuit" he terms it. Prof. Slaby describes how he succeeded in establishing communication between Schöneberg, near Berlin, and Rangsdorf, at a distance of twenty-one kilometres. The Emperor of Germany ordered the balloon department of the army to assist in the experiments, and balloons were anchored at the two places chosen for the transmitting and receiving stations. At both stations thin copper wire was fastened to the baskets of the balloons, reaching two hundred and fifty metres to the apparatus. Connection with the earth was made by means of swords stuck in the ground. The first telegram received under these conditions is reproduced in the article, and the clearness of the Morse characters upon it is most remarkable. The distinctness of the dots and dashes seems all the more noteworthy because of the highly electrical condition of the atmosphere on the day of the experiments. The results demonstrated the possibility of using captive balloons on the high sea for purposes of communication by ethereal telegraphy. In place of balloons, kites of the modern form can be used; for Prof. Slaby says a few experiments have convinced him that they are perfectly adapted to carrying the thin wires required to connect with the apparatus. In connection with Prof. Slaby's observations, it is noteworthy that, during the past few months successful experiments on electrical communication without intervening wires have been made at places on the South Coast, under the direction of Signor Marconi. Regular communication has been maintained between Bournemouth and Alum Bay—the distance between the two stations being about 14½ miles. Signals have also been exchanged between stations 18 miles apart, and arrangements are being made to test the capabilities of the instruments to receive at Cherbourg signals transmitted at Bournemouth—the intervening distance being about 60 miles.

THE concluding part of the 26th *Ergänzungsband* of *Petermann's Mittheilungen* contains a very comprehensive account of the distribution of rainfall over the solid portions of the globe, by Dr. A. Supan. The first rain-chart of the world was published by Prof. E. Loomis in 1882, in the *American Journal of Science*. During the last fifteen years the number of rainfall stations has greatly increased, and the quality of the observations has, generally speaking, much improved. Still the distribution is far from satisfactory, as more than half of the observations emanate from Europe, and even there large tracts are badly represented. The construction of a rain-chart always presents great difficulties, because the distribution of rainfall depends so greatly upon local conditions, upon the exposure of the gauges, and the accurate measurement of snow. And to be strictly comparable the periods ought to be the same. But in a comprehensive work, such as that now in question, the author has no choice but to select the best available materials, and this Dr. Supan has done, and gives full particulars as to the sources from which the information is obtained. In addition to tables giving the monthly and yearly values, the author gives a full discussion of the rainfall of various districts, and the charts show very clearly both the mean annual amounts and the seasonal distribution. The work forms a valuable contribution to our knowledge of the subject.

REFERRING to the report from Vienna that Dr. Schiff has successfully treated cases of lupus vulgaris by means of Röntgen rays, the *British Medical Journal* remarks that his process is to set up an independent inflammation in the lupoid area by exposing the part to a very intense radiation. So far, investigations into the germicidal effects of Röntgen rays have gone to show that their activity in this respect is not greater than that of ordinary light. But Dr. Schiff's result is not a germicidal one, and it is known that inflammation, and even necrosis, may result from exposure in certain cases, although the determining factor which leads to injury in some cases but not in others under apparently similar conditions is unknown. It is not, however, altogether improbable that Dr. Schiff's results may be due to a direct germicidal action of Röntgen rays on the tubercle bacillus. Light is deleterious to this organism, and Dr. Finsen, of Copenhagen, has reported cases of cure in lupus by protracted exposure to concentrated light, so arranged that the ultra-violet rays predominated.

WE have received the first part (for 1896–97) of the *Transactions* of the British Mycological Society. Descriptions are given of several new Fungi, or of species new to Britain.

THE *Botanisches Centralblatt* states that Dr. C. Marchesetti has undertaken a botanical expedition to Upper Egypt and Palestine; and Dr. M. Pedersen (of Copenhagen), an investigation of the vegetation of Disco Island, Greenland.

AT the venerable age of ninety, Prof. R. A. Philippi resigns the directorship of the National Museum at Santiago, Chile, which he has held for forty-three years. He is succeeded by his son.

As "Circular No. 13," the United States Department of Agriculture (Division of Botany) publishes a description, with excellent drawings, of the edible and poisonous Fungi natives of the States, by Mr. Frederick V. Colville.

PROF. D. P. PENHALLOW reprints from the *Transactions* of the Royal Society of Canada a useful review of Canadian botany from 1800 to 1895, being a paper read before the Botanical Section at the last meeting of the British Association.

THE *American Naturalist* for February gives a full account of the first annual meeting of the Society for Plant Morphology and Physiology, held at Ithaca, N.Y., on December 28 and 29, 1897, at which many important and interesting botanical papers were read.

THE *Botanical Gazette* for March gives a list of the persons officially designated by the Government as botanists or mycologists in the United States, fifty in number. These are situated at fifty-one State experiment stations. Every State in the Union, with the exception of ten, has its State botanist, New York and Connecticut having two each.

THE firm of J. B. Baillière et fils, of Paris, is publishing a "Bibliographie Botanique," to appear in five monthly parts of 32 pp., each of two columns. The first fascicle, comprising the letters A to C, will appear shortly. The titles of about 10,000 volumes and pamphlets will be included in the work; the date of publication, number of pages, and some account of the contents will, in each case, be included.

UNDER the title, *Die Metamorphose der Pflanzen, im Lichte palæontologischer Thatsachen*, the well-known palæontologist, Dr. Potonié adduces arguments, derived from the geological history of plants, in favour of the view that all the higher forms of vegetable life have been derived, by metamorphosis, from the forking of an archaic thalloid structure.

THE *Biologisches Centralblatt* continues to publish a succession of interesting papers in both branches of Biology. The phenomena of impregnation in the Rhizopods, non-sexual propagation in Phanerogams, the relationship between the arctic and the antarctic plankton, spermatogenesis in *Paludina vivipara*, the relationships between Phanerogams and Cryptogams, are among the subjects discussed in the most recent numbers.

WE learn from the *Journal of Botany* that a new British flora is in preparation by the Rev. E. F. Linton, who will take the *London Catalogue* for the basis of his work. A large number of "forms," and not a few distinct species, have been added to our flora since the publication of the last edition of the existing manuals. The publication is also announced of a flora of Cheshire by the late Lord de Tabley, which will be edited by Mr. Spencer Moore. The flora of Kent, by Mr. F. J. Hanbury and the Rev. E. S. Marshall, is nearly ready for the press.

Petermann's Mittheilungen contains a new geological map of Java and Madura, by Dr. R. D. M. Verbeek, which is a considerable advance on that published by Junghuhn in 1855. A short paper discusses the relation of the topography of the islands to their geological structure.

DR. MAX ECKERT, of Leipzig, contributes a paper to *Petermann's Mittheilungen* on the Karren and Schratten districts of the German Alps. Various forms of primary and secondary Karren are recognised; the most typical form occurring in pure chalk at levels where weathering is greatest—*i.e.* between 1600 and 2300 metres.

IN a paper published in the *Zeitschrift für praktische Geologie*, Prof. Dr. Rudolf Zuber, of the University of Lauberg, discusses modern theories of the formation of petroleum. The author believes that the hypotheses at present in the field are either too purely chemical or too purely geological, and he criticises a number of them from this point of view, without, however, advancing anything definitely new to take their place.

WE have received a reprint, from the *American Antiquarian*, of a paper on the geography of the Tsimshian Indians, by Mr. G. A. Dorsey. The Tsimshian Indians form one of the most important stocks of the North-west; they inhabit villages on the Nass and Skeena rivers of British Columbia, and are distinct in language from the neighbouring tribes. Mr. Dorsey's paper chiefly consists of a list of the villages, and notes as to name, position, &c., of each.

THE instruments devised for recording the occurrence of an earthquake, or analysing its motion are very numerous, and are described in many scientific journals. Dr. R. Ehlert has, therefore, rendered a great service by collecting and classifying in one memoir (Gerland's *Beiträge zur Geophysik*, vol. iii.) the accounts of all the more important seismographs and seismoscopes that have so far been constructed.

THE latest addition (No. 1084) to the Smithsonian Miscellaneous Collections is a "Bibliography (1748–1896) of the Metals of the Platinum Group"—platinum, palladium, iridium, rhodium, osmium, ruthenium—by Prof. J. L. Howe. The publication of this volume was recommended by the Committee of the American Association for the Advancement of Science having charge of indexing chemical literature. All papers upon metals of the platinum group found in scientific literature to the close of 1896 are given in the order of the date of appearance, and are also indexed according to subjects and authors. It is thus easy to determine what papers have been published upon the physical and chemical characteristics and properties of any members of the platinum group of metals. The volume will therefore be of the highest value to many scientific investigators; and by publishing it the Smithsonian Institution has increased the obligations which men of science owe to the Institution for making works of this character available.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus*, ♂) from India, presented by Mr. H. Times; a Silver-backed Fox (*Canis chama*), a Suricate (*Suricata tetradactyla*) from South Africa, presented by Mr. W. Champion; a Grey-breasted Parrakeet (*Myopsittacus monachus*) from Monte Video, presented by Mrs. Evelyn Heathcote; a Gold Pheasant (*Thaumalea picta*, ♂) from China, presented by Mrs. Abbot Robinson; a Long-necked Chelodine (*Chelodina longicollis*) from Australia, presented by Mr. R. Kirkwood; an Isabelline Bear (*Ursus isabellinus*) from India, deposited; a Red-vented Cockatoo (*Cacatua hæmaturopygia*) from the Philippine Islands, two Toco Toucans (*Ramphastos toco*) from Guiana, a Lapwing (*Vanellus cristatus*, two Knots (*Tringa canutus*) from Lincolnshire, purchased; a Gayal (*Bibos frontalis*, ♀), a Mouflon (*Ovis musimon*, ♂), a Hog Deer (*Cervus porcinus*, ♀), born in the Gardens.